become unreliable and almost worthless when they enter upon weka-hunting. It is a well-known fact that wekas usually abound in districts infested with wild pigs; they probably find their advantage in feeding on the varied forms of insect life disclosed in the soil upturned by the swine in rooting up ferns, spear-grass, &c.

The Kea (*Nestor notabilis*).—In NATURE, vol. iv. p. 489, I called attention to certain destructive habits developed in the Kea. Since the date when that notice was written the bird has become very much better known to sheep-farmers in the alpine districts. During the past winter sheep were attacked by the kea as far north as the Rangitata River; it is probable these birds came from the district known as the Mackenzie country, as they have been troublesome about Lake Ohou.

A New Zealand Gamekeeper's Return.—Naturalists may read with some interest perhaps the following return of animals killed by gun or trap, on a large estate in the Middle Island; the numbers given do not include animals that have been destroyed by means of poison, or "the bill of mortality" would have been very much heavier.

From January 12, 1879, *to August* 24, 1879

Wild pigs	108
,, cats	18
Rats	1,054
Falcons	10
Harriers (*Circus assimilis*)	790
Wekas (*Ocydromus*)	893
Pukekos (*Porphyrio melanotus*)	5,074
Paradise ducks (*Casarca variegata*)	175
Shags	9
	8,131

Ohinitahi, October 7 T. H. POTTS

SCIENTIFIC SERIALS

Journal of the Asiatic Society of Bengal, vol. 48, Part 2, No. 11, 1879, contains:—S. E. Peal, note on the old Burmese route over Patkai *via* Nongyang (viewed as the most feasible and direct route from India to China), with two maps and two plates.—Louis Schwendler, on a new standard of light, with a plate.—W. T. Blanford, a second note on mammalia collected by Major Biddulph in Gilgit.—Dr. J. Armstrong, Marine Survey Department, on some new species of hydroid zoophytes from the seas and coasts of India, with four plates.—Lieut. R. C. Temple, note on the formation of the country passed through by the 2nd column Tal Chotiali field force during its march from Kala Abdullah Khán, in the Khójak Pass to Lugári Bárkhan, in the spring of 1879, with a map.—W. T. Blanford, notes on a collection of frogs and reptiles from the neighbourhood of Ellore and Dumagudem.—J. Wood-Mason, preliminary notice of a new genus (Parectatosoma) of Phasmidæ, from Madagascar, with descriptions of two species.

SOCIETIES AND ACADEMIES

LONDON

Royal Society, December 11.—"On the Reversal of the Lines of Metallic Vapours," No. VII. By G. D. Liveing, M.A., F.R.S., Professor of Chemistry, and J. Dewar, M.A., F.R.S., Jacksonian Professor, University of Cambridge.

The experiments of which the results are here given were all made with the powerful electric current from the Siemens dynamo-electric machine in limestone crucibles.

With sodium carbonate the green pair wave-lengths 4983, 4982 were reversed, showing dark lines in the middle of the bright ones, the less refrangible of the two giving the stronger dark line. The sodium line given by Lecoq de Boisbaudran at wave-length 4670 showed as a diffuse blue band with a *pair* of fine dark lines in it, of which the stronger and more lasting was the less refrangible. The diffuse blue band resolved itself into *two* diffuse lines as the sodium carbonate evaporated, and the measurement of their positions in comparison with a conspicuous titanium line, which lies between them, and was made to show at the same time by introducing a fragment of titanic oxide into the crucible, gave for this sodium pair the wave-lengths 4667, 4664. The red pair, wave-lengths 6160, 6154, were also seen reversed in like manner, but the authors failed to detect any difference in the strength or continuance of the dark lines in this case. The reversals of the red pair first ceased to be visible, next those of the diffuse blue pair, then the dark lines in the green pair, and then those in the yellowish green (5687, 5681). In some cases when a large quantity of sodium carbonate was put into the crucible a curious double reversal occurred. In the middle of an enormous dark expansion of D a bright yellow band appeared, which in turn had a narrower dark band, or a pair of dark lines, in its middle. A similar double reversal of the lithium blue line occurred so far as to show a bright line in the middle of the dark one. Of the two violet lines of potassium the authors observed that the more refrangible remained reversed longer than the other.

In addition to the reversals of calcium lines before observed by them, the authors have noticed the reversal of all the more conspicuous calcium lines of the G group and some others. The finer lines, wave-lengths 4434·3, 4454·5, slightly less refrangible than the strong lines 4434, 4454, were reversed, but only when one of the poles was a bar of iron, instead of carbon. The strong lines just mentioned were expanded so as to cover their neighbours, and all four lines were seen black against the bright background in the positions and of the same relative strengths as when bright.

When strontium chloride was put into the crucible twelve lines besides those before noted were observed reversed. Besides these, many dark bands were observed in the less refrangible part of the spectrum, of which three appear to be identical with bright bands ascribed to strontia, and one with a bright line given by strontium chloride.

Manganese, introduced as sulphate, gave with facility the violet triplet, as dark lines on the continuous background. The bright blue lines of manganese were not, however, reversed until some metallic magnesium was introduced. This brought out the reversal of the lines, wave-lengths 4753, 4783, and 4823, the last being the most easily reversed of the three.

Lead introduced in the metallic state gave a reversal of the violet line, wave-length 4058, which Cornu had previously seen reversed, but this reversal was far better seen, becoming a wide black band when the lead was introduced as an alloy with zinc. Probably the lead vapour was not so rapidly oxidised when mixed with zinc, and a thicker, if less dense, stratum interposed between the arc and the spectroscope. When lead ferrocyanide was used, not only the line above mentioned was reversed, but also, much less strongly, a line near it, wave-length 4062.

With zinc, only the less refrangible two of the three bright blue lines were seen reversed. The very bright lines, wave-lengths 4924, 4911, seen in the spark between zinc poles, were not seen at all in the arc, resembling in this respect the magnesium line, wave-length 4481, and the cadmium lines, wave-lengths 5377, 5336.

When cadmium was put into the crucible the lines, wave-length 5085, 4799, and 4677 were reversed, not the line, wave-length 4415. With a large dose of cadmium the red line, wave-length 6438, was once seen reversed for an instant only.

With silver, besides the reversals before observed by the authors, the line, wave-length 4053, showed a dark line in the middle of its expansion as noticed by Mr. Lockyer, but they could see no reversal of the line, wave-length 4208. Instead of the reversal of this line they observed that a second bright line came out close to it, rather diffuse, and about midway between the line 4208 and the calcium line 4215. This second line coming out near the other silver line gave the appearance of a reversal in the middle of a diffuse line, but besides the measurements made with a micrometer the authors assured themselves of the fact by watching the fading of the second line as the silver evaporated. The use of an alloy of zinc with silver did not alter the appearance of these two lines, or bring out a reversal of either of them. The authors failed to see any line of silver either bright or reversed with wave-length about 4240, as noticed by Cornu. With the carbons arranged vertically and the light viewed through the upper, perforated carbon, silver gave a channelled spectrum as described by Lockyer and Roberts. As this channelled spectrum was not seen with silver in any other arrangement of the crucibles, the authors are led to attribute it to a comparatively cool condition of the silver vapour ascending the carbon tube, a condition of near approach to a state of liquefaction.

Having observed that lines frequently came out with mixtures which were not visible when the separate ingredients were used, they tried a few amalgams. None of these showed any reversals of the mercury lines. But an amalgam of bismuth gave readily the reversal of the bismuth line, wave-length 4722, and with more difficulty that of the line, wave-length 4119.

Antimony did not appear to give any lines, or none easily distinguishable, in the arc.

With copper the reversal of two lines only were observed, wave-length 5105, 5153.

Iron introduced as metal, or as chloride, in the usual way, gave no reversal; with an iron rod used as positive pole instead of one of the carbons, the authors succeeded in getting the reversal of one line, wave-length 4045, which expanded and showed a fine dark line in its middle; but by passing an iron wire into the arc through the positive carbon, which was perforated, and pushing in the wire slowly as the end burned away, several of the brightest of the iron lines were reversed. The three violet lines, wave-lengths 4045, 4063, 4071, were the first to be reversed. They all expanded before showing reversal, and the order of reversal was that of refrangibility. Besides these seven other of the brightest lines were reversed.

Nickel, whether put into the crucible in the old way, or fed into the arc in small fragments filling a platinum tube which was passed through a perforated carbon pole, gave no definite reversal of any of its lines; nor did cobalt, even when a bar of cobalt was used as the positive pole.

Tin, palladium, and platinum gave no reversals.

It is worthy of remark in regard to the difficulty of obtaining substances chemically pure that the authors found that carbon poles which had been for some hours ignited in a current of chlorine and further intensely heated in the arc, while a current of chlorine was passed through perforations down their axes, still showed in the arc, of course without any crucible being employed, a multitude of lines amongst which the so-called carbon lines and those of calcium and iron were conspicuous.

December 18.—"On the Capillary Electroscope," by G. Gore, LL.D., F.R.S.

This paper contains a description of a modified form of the "Capillary Electroscope," together with full details of its construction and of the circumstances which affect its successful action. Numerous forms of the apparatus were constructed and a variety of solutions employed with the hope of obtaining an instrument capable of being employed for accurate measurements of feeble electromotive forces, but without success. The author is now engaged in examining the behaviour of a variety of liquids in the apparatus, and in completing an investigation of the causes and conditions of the movements. During this examination he has discovered the singular circumstance that in certain cases the mercury moves in an opposite direction to the electric current.

Mathematical Society, December 11.—C. W. Merrifield, F.R.S., president, in the chair.—The following gentlemen were elected members:—Mr. W. Burnside, Mr. J. R. Harris, Dr. W. Jack, Mr. W. J. Curran Sharpe, and Prof. W. Woolsey Johnson, St. John's College, Annapolis, Maryland.—The following communications were made to the Society:—Note on a method of obtaining the q-formula for the sine-amplitude in elliptic functions, by Mr. J. W. L. Glaisher, F.R.S.—Note on a numerical theorem connected with the cubical division of space, by the President.—Notes on Curvature, by Mr. J. J. Walker.—A property of a linkage, by Mr. A. B. Kempe.—Mr. Merrifield's note arose thus:—it is known that if space be cubically divided by three systems of orthogonal and equidistant planes, there must be an infinite number of ways of selecting points of the system, which shall be the corners of cubes obliquely placed and the theorem (*infra*) shows that the edges of such cubes will be commensurable with the unit of the system. Take $OA = OB = OC$, orthogonal to one another, and the coordinates of A, B, C referred to rectangular axes, rational numbers, it is shown that the length $OA = OB = OC$ is also a rational number. If $l_1\, m_1\, n_1$; $l_2\, m_2\, n_2$; $l_3\, m_3\, n_3$ are the coordinates of A, B, C respectively, then we have—

$$l_2\, l_3 + m_2\, m_3 + n_2\, n_3 = 0,$$

and two other like equations. Also if

$$r = \frac{m_2\, n_3 - m_3\, n_2}{l_1} = \ldots = \ldots$$

then $(l_2^2 + m_2^2 + n_2^2)(l_3^2 + m_3^2 + n_3^2) = r^2(l_1^2 + m_1^2 + n_1^2)$, or $OB^2 \,.\, OC^2 = r^2\, OA^2$. Therefore if any two of the three lines OA, OB, OC are equal, the third is rational. A few numerical examples are given:—

$$r = 9, \left\{\begin{matrix} -8 & 4 & 1 \\ 4 & 7 & 4 \\ 1 & 4 & -8 \end{matrix}\right. \qquad r = 21, \left\{\begin{matrix} -19 & 8 & 4 \\ 8 & 11 & 16 \\ 4 & 16 & -13 \end{matrix}\right.$$

$$r = 11, \left\{\begin{matrix} -9 & 6 & 2 \\ 6 & 7 & 6 \\ 2 & 6 & -9 \end{matrix}\right. \qquad r = 25, \left\{\begin{matrix} 9 & 12 & -20 \\ 12 & 16 & 15 \\ -20 & 15 & 0 \end{matrix}\right.$$

Values were also given for $r = 19$, 23, other values proved refractory. If the above are read as determinants, the groups are all symmetrical, 9, 11, 19 being symmetrical about both diagonals. The value of the determinant is always $\pm r^3$ as it should be, being simply the volume of the cube of which r is an edge. Mr. Glaisher pointed out that the diagonal about which there is symmetry has the sum of its terms $= \pm r$. The reason for this and why there should be symmetry, is not so apparent.

Geological Society, December 3.—Henry Clifton Sorby, F.R.S., president, in the chair.—Syed Ali, Wynne Edwin Baxter, Arthur Robert Boyle, Rev. John Lowry Carrick, M.A., Prof. Edward Waller Claypole, Rev. T. Dowen, Rowland Gascoyne, George M. Henty, John Marshall, Josiah Martin, Charles Maxted, Edward Provis, Thomas William Rumble, Rev. John Reuben Taft, Octavius Albert Shrubsole, Samuel Richard Smyth, and William Neish Walter were elected Fellows of the Society.—The following communications were read:—The gneissic and granitoid rocks of Anglesey and the Malvern Hills, by C. Callaway, F.G.S., with an appendix on the microscopic structure of some of the rocks, by Prof. T. G. Bonney, F.R.S., Sec.G.S. The author described the results of his investigations into the stratigraphy and petrology of the above districts, which have led him to the following conclusions:—1. The granitoid (Dimetian) rocks of Anglesey pass down into an anticlinal of dark gneiss (above) and grey gneiss (below). 2. Associated with the granitoid series are bands of felsite, hälleflintas, and felspathic breccias. 3. The succession of gneissic and granitoid rocks in Anglesey resembles so closely the metamorphic series of Malvern as to justify the correlation of the two groups. 4. The pre-Cambrian rocks of Anglesey and the Malverns, from the highest known member down to the base of the gneiss, may be thus classified:—A. Pebidian (to be described hereafter); B. Malvernian; (*a*) Dimetian, with associated quartz-felsites and hälleflintas (Arvonian) passing down into (*b*) Lewisian.—Petrological notes on the neighbourhood of Loch Maree, by Prof. T. G. Bonney, F.R.S., Sec.G.S. The author described the microscopic structure of a typical series of the Hebridean gneiss, and gave reasons for considering the mass of rock on the right bank of Glen Laggan to be not an intrusive "syenite," as has usually been supposed, but a mass of the Hebridean gneiss faulted against the *newer* series. By examination of specimens, collected both in Glen Laggan and at other points along the northern escarpment of the *newer* series, the author showed that its rocks have been rightly called metamorphic; and then, by comparison of these with specimens collected in Glen Docherty, he concluded that the latter belonged to the *newer* series, and that no part of the Hebridean series reappeared here.—On some undescribed Comatulæ from the British secondary rocks, by P. Herbert Carpenter.

Zoological Society, December 16.—Prof. Flower, F.R.S., president, in the chair.—Mr. H. Seebohm exhibited and made remarks on a collection of birds made by Captain the Hon. G. C. Napier, in the valley of the Atreck, near the south-east corner of the Caspian Sea.—Mr. R. G. Wardlaw Ramsay exhibited a specimen of *Pericrocotus flammeus* in an abnormal state of plumage, obtained on the Neilgherry Hills in Southern India.—Mr. Sclater exhibited a small collection of birds from the Island of Montserrat, West Indies, received from Mr. J. E. Sturge, of that island. This collection, though small, was of much interest, as nothing was previously known of the ornithology of Montserrat.—Mr. T. J. Parker read a paper on the intestinal spiral valve in the genus *Raia*. Mr. Parker showed that there were four types of valve exhibited in individuals of that genus, differing from one another in morphological characters, in the extent of absorption surface presented to the food, and in the resistance offered to the passage of food.—A communication was read from the Marquis de Folin on the mollusca of the *Challenger* Expedition of the genera *Parastrophia*, *Watsonia*, and *Cæcum*.—Prof. W. H. Flower, F.R.S., read a communication on the cæcum of the Red Wolf (*Canis jubatus*), in which it was shown that that animal differed from the majority of the *Canidæ* in possessing a very short and perfectly straight cæcum.—A communication was read from Mr. Edward Bartlett containing a list of the mammals and birds collected by Mr. Thomas Waters in

South-East Betsileo, Madagascar. The collection contained a new species of rodent belonging to the genus *Nesomys*, and two new species of birds of the genera *Cypselus* and *Zapornia*.—Dr. A. Günther, F.R.S., read the description of a new species of Dwarf Antelope, obtained by Dr. Kirk near Brava in the South Somali country. Dr. Günther proposed for this new species the name of *Neotragus kirki*.—A communication was read from Mr. Martin Jacoby containing the descriptions of new species of phytophagous coleoptera.—A communication was read from Prof. J. Reay Greene, F.Z.S., on a remarkable Medusa (*Charybdæa haplonema*), from Santa Catharina, Brazil.—Mr. Edward R. Alston read a description of a skull of a chamois with four horns, which had been exhibited at a previous meeting of the Society.—Mr. Henry Seebohm read a paper on certain obscure species of Siberian, Indian, and Chinese thrushes.

Physical Society, December 1.—Prof. W. G. Adams in the chair.—New Members—Mr. J. H. Poynting, Mr. R. T. Glazewood, Dr. R. C. Shettle, Prof. Rowland, Mr. John Gray, D.Sc., Mr. H. R. Brook, Mr. E. B. Sargent, Mr. E. Paterson.—On the graduation of the sonometer, by M. J. H. Poynting, Trinity College. The author had endeavoured to reduce the present arbitrary readings of the sonometer of Prof. Hughes to absolute measure by adapting the formula given in Maxwell's "Electricity," vol. ii. chap. xiv., to the induction of two circular coils on the same axis, separated by a distance greater than the radii of the coil, on a third coil intermediate. By applying the formula thus obtained to the results of Prof. Hughes for different metals, he finds that either the specific resistances of metals as given in the tables are not the same as the resistances of the metals employed by Prof. Hughes, or that the induction effect of the balance or sonometer is not proportional to the conductivity of the metal.—Prof. Ayrton reminded the Society that at a former meeting he had shown mathematically that the effect was not proportional to the conductivity, but to an exponential function of the conductivity. Mr. Chandler Roberts, F.R.S., stated that Prof. Hughes did not profess that the metals used by him to obtain his results were pure. Prof. Adams mentioned that Prof. Hughes had shown that the effect was dependent on other conditions than the mere purity of the metal.—Dr. J. A. Fleming, St. John's College, Cambridge, exhibited and described a new form of Wheatstone balance, designed principally for comparing the B.A. units of resistance deposited in the Cavendish Laboratory. The divided resistance is a circular platinum-iridium wire and an arm fitted with a contact at its extremity revolves round after the manner of circular resistance coils, thus altering the ratios of the divided resistances. The contact is a knife-edge of platinum, and it is made and broken by hand like a key. A series of ingenious copper mercury cups are fitted to the balance so as to permit of two coils being compared at any temperature with great exactness by the method suggested by Prof. Foster and adopted by Prof. Crystal, of Cambridge. This consists in exchanging the positions of the units on the balance and observing the difference in the results. By Dr. Fleming's arrangement this exchange can be effected without removing the coils from the heating apparatus in which they are placed or otherwise altering their conditions. The mercury contact cups and the heating cans were also improved by Dr. Fleming for the purpose of facilitating accuracy of results.—Prof. Perry described a dispersion photometer devised by himself and Prof. Ayrton for the purpose of comparing intense lights such as the electric with a standard candle without taking up much room, in order to put the stronger light at a distance from the screen proper, to give an illumination equal to that of the candle. To reduce the distance of the stronger light from the screen, the authors had inserted a lens in the track of the beam, so as to disperse the beam to a degree which could be determined by an easy formula. Thus by artificially diluting the powerful beam they could compare it with the feebler beam from the standard light in a shorter space. For an electric light of 6,400 candles only eight feet need be required by the new plan instead of eighty feet by the unassisted method. Dr. John Hopkinson, F.R.S., stated that he had actually used the same method for some months past in his electric light experiments. He recommended a plano-convex lens as the best to use, and suggested that the focal length should be calculated. He thought that the error due to absorption could easily be obviated.—Prof. Ayrton then described a method by which Prof. Perry and he had determined the value of g, or the coefficient of gravity at the Imperial Engineering College, Tokio, Japan, by means of pendulums. Their result is 980·06, and calculation from the position of the places makes it 979·8.—An improved form of spherometer, designed by Mr. W. Goolden and made by Mr. Adam Hilgar, was exhibited to the meeting. The frame is of aluminium, combining lightness and rigidity; the legs and screws of hard steel. The screw carries a drum divided into 1,000 parts, and the instrument gives a reading to the $\frac{1}{100000}$th of an inch by the usual method of touch. Increased sensitiveness is got by employing a galvanometer to indicate the contact of the middle pointer with the surface. By this means it is made correct to the $\frac{1}{500000}$th of an inch.

Anthropological Institute, December 9.—Edward B. Tylor, F.R.S., president, in the chair.—The President read some communications from the Rev. L. Fison and Mr. J. Forrest, on Australian marriage customs, which will materially assist in clearing away the difficulties which surround this interesting subject. Mr. Morgan in his "Ancient Society," says that amongst the aborigines of Australia there exists a state of communal marriage not found elsewhere, viz., that any man in a given tribe or class A is the husband of every woman in another class B. This view, however, Mr. Fison states, is not quite accurate, and he explains that men belonging to a class A can marry women belonging to another class B and no others; and that if a man from class A visit a station occupied by class B, he is provided during his stay there with a temporary wife. The offspring belongs not to either the father's or the mother's class, but to a third class C which is in its turn provided with wives exclusively from a fourth class D.—In the absence of the author the Director read a paper on savage and civilised warfare, by Mr. J. A. Farrer. It is interesting to note the existence of certain laws of war among the lower races, because it is generally assumed that they are only the product of an advanced civilisation, and the glory of a so-called civilised warfare. Even amongst the Khonds, it is necessary, previous to an attack, to allow the enemy to complete the same fetichistic ceremony as the offensive tribe itself performs.—The Caffres consider it shameful to attack their enemy without a declaration of war, and when war has broken out they refrain from seeking to starve him out; they spare the lives of women and children, and restore them after the war. The Canarians held it to be base and mean to injure the women and children of the enemy. War between civilised nations might well become a moral impossibility irrespective of any international treaty of disarmament. All that is wanted is a certain amount of human opinion and human will; of opinion, that quarrels may and should be settled peaceably, of will, that they shall be settled in no other way. Not more will is required than sufficed to put down the slave trade; nor is any stronger opinion needed than was enough for the extinction of duelling and torture.—Mr. Worthington G. Smith exhibited a collection of sixty specimens of Palæolithic implements chiefly from the valley of the Axe, many of them unusually large and heavy and in an excellent state of preservation.—Four water-colour portraits of Tasmanians were exhibited taken about forty years ago, and showing clearly all the physiognomical peculiarities of that interesting race.

Royal Microscopical Society, December 10.—Dr. Beale, F.R.S., president, in the chair.—Ten new Fellows were elected, and ten proposed for election at the next meeting.—The following papers were read:—Mr. Dallinger on a series of experiments made to determine the thermal death-point of known monad germs when the heat is endured in a fluid.—Mr. Gulliver on the classificatory significance of rhaphides in *Hydrangia*.—Prof. M. Duncan on a part of the life-cycle of *Clathrocystis æruginosa*.—Mr. Washington Teesdale on a simple revolving object-holder.—Amongst the objects exhibited were annelid jaws by Mr. G. J. Hind, sections of plants by Mr. G. J. Ward, a revolving table microscope for thirty objects, a Schmidt's microscope with spiral focal adjustment, and various hose-pieces and stage plates, by Mr. Crisp.

Meteorological Society, December 17.—Mr. C. Greaves, president, in the chair.—T. Buckland and J. Wigner were balloted for and duly elected Fellows.—The following papers were read:—On a sand-storm at Aden, July 16, 1878, by Lieut. Herbert H. Russell, 8th Regiment.—On a new form of hygrometer, by G. Dines, F.M.S. This is a modification of the hygrometer which was first described at the British Association meeting in 1872. The outside dimensions of the instrument, inclusive of the wood casing, are about 10 inches in length, 3 inches in breadth, and 2 inches in depth. The upper part consists of a vessel of thin metal, 6 inches long, 2½ inches broad, and 1¼ inch deep. Beneath this, and detached from it, but connected by a pipe, is a small chamber 2¼ inches long and 1¼ inch deep from back to front, standing about ½ inch more forward than the vessel above, and with a piece of thin, black glass in front. Inside this chamber, parallel to the front, is a division which separates it into two parts. This division does not extend quite to the top of the chamber, and is slightly turned over towards the front, so as to allow water to pass over it, and to induce the latter to flow more directly to the centre of the front of the chamber. The upper vessel is connected with the bottom and back part of this chamber by a small pipe with a tap to it, which is turned from the outside. The front of the chamber has a pipe attached to the bottom, passing upward in an inclined direction, and terminating at the outside in a small lip or spout. A thermometer, with the bulb inside and over the front of the chamber, passes through an india-rubber collar at the top of it, and is protected by a groove sunk in the face of the wooden case. The action of the instrument is as follows:—Water, of a lower temperature than the dew-point, is placed in the upper vessel, and, on the tap being turned, flows into the back of the small chamber, and thence, passing over the top of the middle division, flows downwards, cooling in its passage the thermometer and black glass, and eventually escapes by the small spout on the right side of the instrument. As soon as dew appears on the glass, the flow of the water is stopped by means of the tap and the temperature is read off by the thermometer. When ether is used it is poured into the small spout, passes down the inclined pipe and remains in the front part of the chamber. A piece of metal tube, ground so as to fit tightly the inclined pipe and with an aspirator attached, is then inserted, and the dew point is ascertained in the same way as by Regnault's hygrometer.—The diurnal range of atmospheric pressure, by R. Strachan, F.M.S. The author has compiled a table of constants from thirty places in various parts of the globe, which support Sir John Herschel's remark that "the diurnal oscillation of the barometer is a phenomenon which invariably makes its appearance in every part of the world where the alternation of day and night exists, and that within the Arctic Circle the diurnal dies out, or rather merges in, the annual oscillation."—Note on a curious fracture of a solar radiation thermometer, by G. M. Whipple, B.Sc., F.R.A.S.—Mr. R. H. Scott, F.R.S., exhibited and described a new form of sunshine recorder, which is to be used during the coming year at a considerable number of stations distributed over England.

Society of Telegraph Engineers.—At the annual general meeting of the Society on the 10th inst., the following gentlemen were elected office-bearers for the year 1880:—President—W. H. Preece. Vice-president—Prof. Foster, F.R.S., Carl Siemens, Willoughby Smith, Major Webber, R.E. Council—Prof. Adams, F.R.S., W. A. Andrews, W. T. Ansell, Sir Charles Bright, H. G. Ericksen, Col. Glover, R.E., Charles Hockin, Prof. Hughes, Louis Loeffler, C. E. Spagnoletti, Augustus Stroh, C. F. Varley, F.R.S., Members, and Alexander J. S. Adams, Capt. Macgregor Green, R.E., and J. T. Hill, Associates. Hon. Treasurer—Edward Graves. Hon. Sec.—Lieut. Col. Frank Bolton. Secretary—F. H. Webb.—The Annual Report of the Council stated that fifty nine new Members and Associates had been elected during the year. Among the losses by death the Society had to deplore those of Sir William Fothergill Cooke, Prof. Clerk Maxwell, and Mr. R. S. Brough. Special mention was made of the International Telegraph Conference, held in London in the summer, many of the most distinguished delegates being foreign members of the Society. Many valuable and interesting papers have been read during the session. The printing of the "Ronalds Catalogue," containing upwards of 12,000 entries, is being rapidly proceeded with, nearly 400 pages have been set up in type, of which 360 have been finally corrected and struck off. The valuable library equeathed to the Society by Sir Francis Ronalds, including some hundreds of rare pamphlets, and constituting the most important collection of works on electricity and magnetism in the world, is being bound, and will shortly be available for the use of the members of the Society, and all students of electrical science. It was stated that steps were being taken for the incorporation of the Society, and that arrangements were in contemplation for the further development of its proceedings in respect to the purely scientific branch of electricity. The Society would be duly represented in the deliberations, being held to give effect to the proposal for the erection of a central hall to accommodate all the societies established for the encouragement of the applied sciences, towards which scheme Dr. Siemens had offered the munificent contribution of 10,000*l.* The financial position of the Society is very satisfactory.—A paper was read by Mr. E. Marsh Webb on the operations connected with the laying of the new Algiers-Marseilles cable, which led to an interesting discussion.

Manchester

Literary and Philosophical Society, November 10.—Charles Bailey, F.L.S., president, in the chair.—Additional note on hydra, by Marcus M. Hartog, F.L.S.—On some undescribed hairs in Copepoda, by the same.—On an undescribed Acinetan, by the same.

November 18.—J. P. Joule, F.R.S., president, in the chair.—Recording sunshine, by David Winstanley, F.R.A.S.—On some notices in classical authors of the action of sunlight on purple dye, by James Bottomley, F.C.S.—On the origin of the word chemistry, by Carl Schorlemmer, F.R.S.

December 2.—R. Angus Smith, F.R.S., in the chair.—On a peculiar feature in the water of the well in Carisbrooke Castle, Isle of Wight, by Harry Grimshaw, F.C.S.—Note on the identity of the spectra obtained from the different allotropic forms of carbon, by Arthur Schuster, F.R.S., and H. E. Roscoe, F.R.S.

Boston, U.S.A.

American Academy of Arts and Sciences, November 12.—The following papers were presented:—On the relative replacability of the bromine in the three brombenzyl bromides, by Prof. C. Loring Jackson.—On a new form of astronomical level, by Prof. W. A. Rogers. This consists of a mercury surface to which any surface can be brought parallel by means of electrical contacts.—On orthobrombenzyl compounds, by C. Loring Jackson and J. L. White.—On measurements of the satellites of Mars, by Prof. E. C. Pickering. Prof. Pickering described the measurements of the position angles of the satellites of Mars, now in progress at the Harvard College Observatory. Instead of spider lines, two glass threads of such a diameter that they are visible without illumination are used. The settings are made accurately and rapidly by placing the lines so that they shall cut off equal segments of the planet and that the satellites shall be midway between them. The light of the planet is reduced by a shade glass, so that it can be seen at the same time as the satellite. The improvement of the method more than compensates for the increased distance of Mars, so that the observations are much more accordant than those taken in 1877. When the outer satellite is well seen, the probable error of the separate settings, compared with their mean, is less than half a degree. 180 settings of Deimos and 33 of Phobos have already been obtained.—Prof. Hagen read a paper on the destruction of insect pests by dilute yeast.—Prof. Trowbridge read by title a paper on dynamical ideas in the calculus.

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